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(54) **METHOD FOR THE POSITIONING OF OPERATIVE CYLINDERS ON A GRINDING MACHINE AND GRINDING MACHINE WHICH IMPLEMENTS THIS METHOD**

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(57) **ABSTRACT**

A method for positioning operative cylinders, for example of rolling-mills or paper-mills on a grinding machine, includes at least the following steps: A—positioning the transversal, longitudinal center-line plane of the cylinder in correspondence with a reference point situated between a movable piece-holder head and tailstock center of the machine; B—moving the piece-holder head and the tailstock center in the direction of the cylinder until there is a reciprocal coupling. The present invention relates also to a machine for implementing the above method.

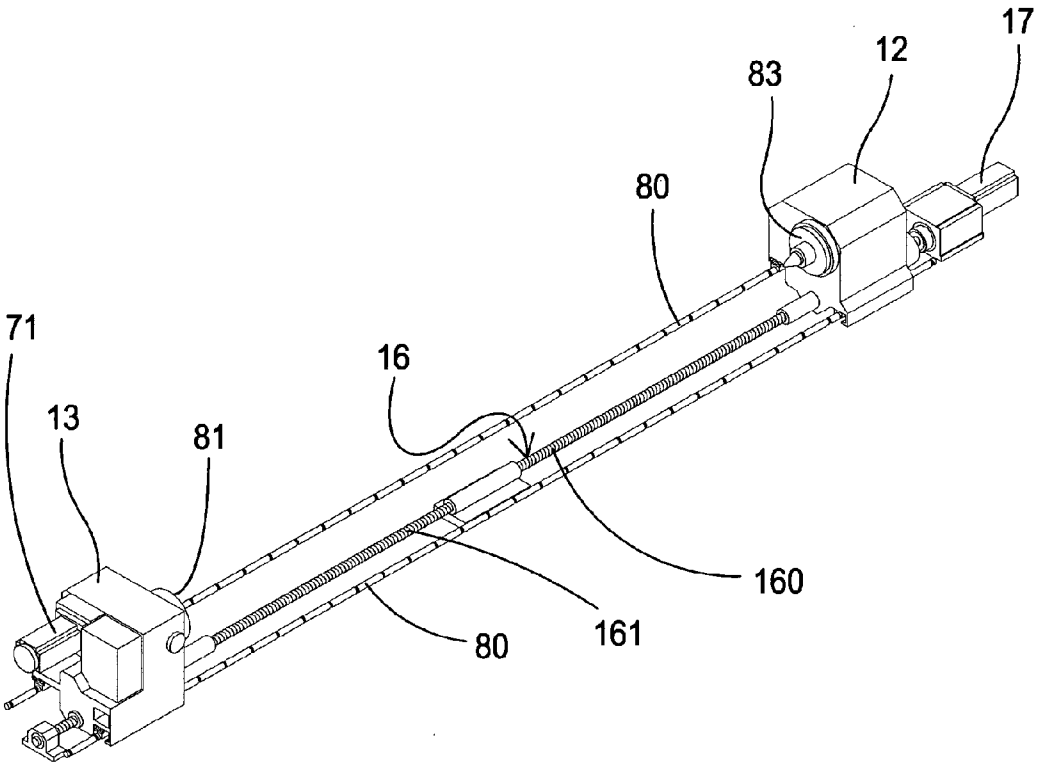


Fig. 1

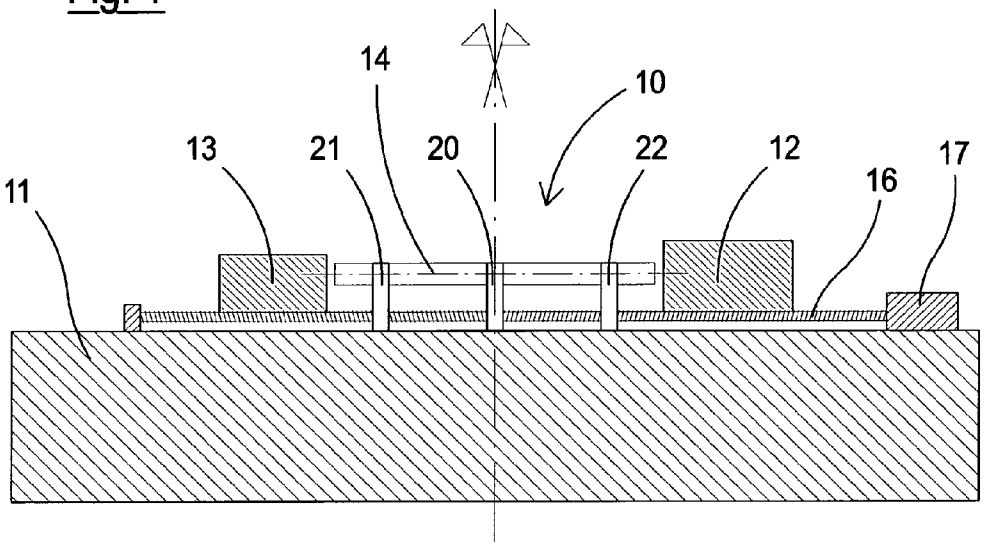


Fig. 2

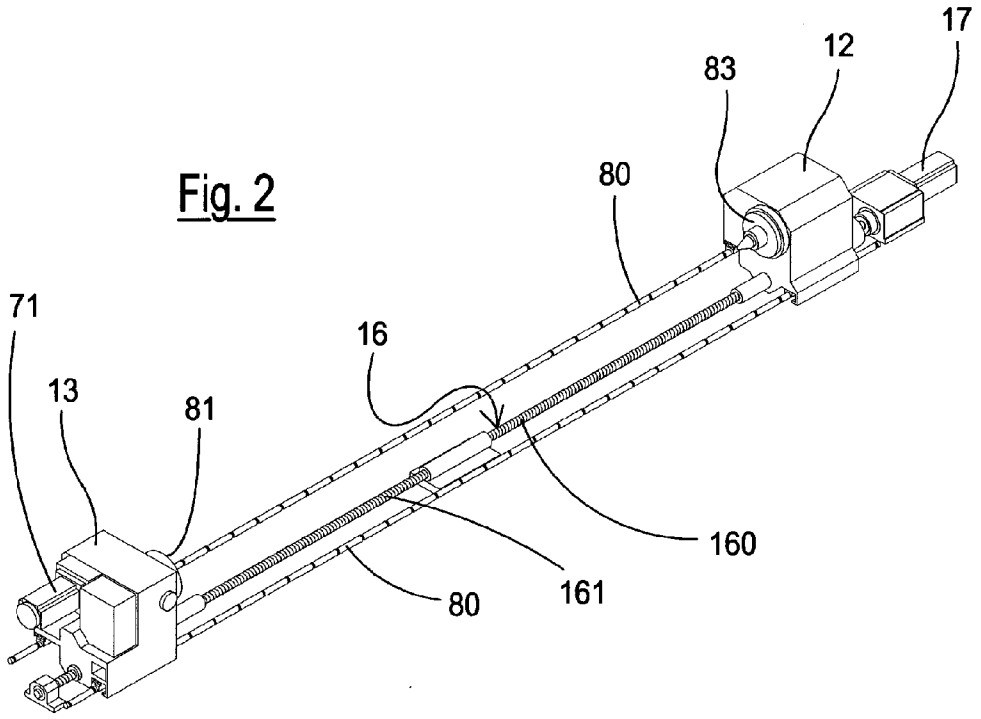
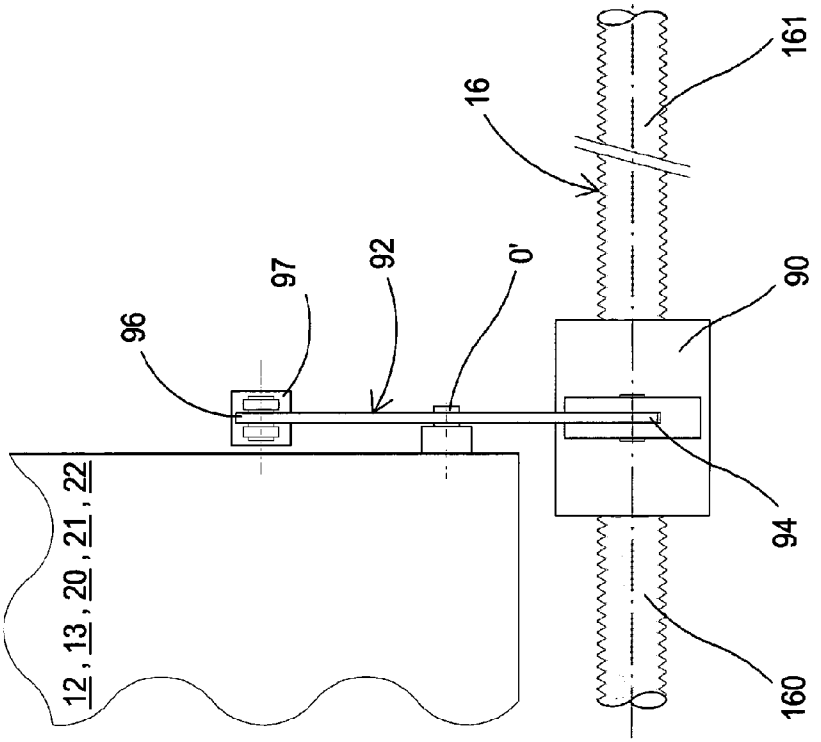


Fig. 4


12, 13, 20, 21, 22
96
97
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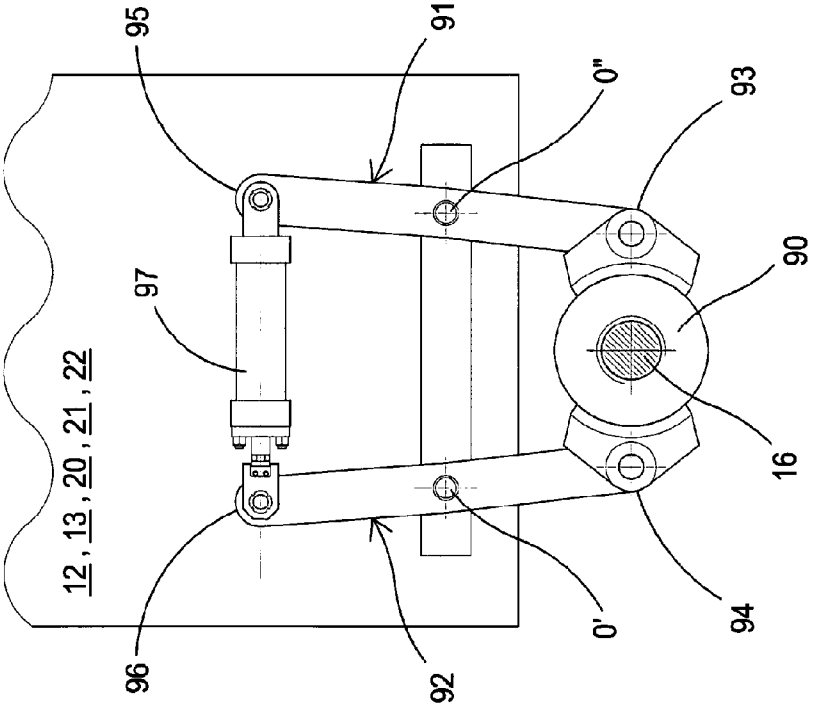
16
161
90
94
160

Fig. 3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METHOD FOR THE POSITIONING OF OPERATIVE CYLINDERS ON A GRINDING MACHINE AND GRINDING MACHINE WHICH IMPLEMENTS THIS METHOD

FIELD OF THE INVENTION

[0001] The present invention relates to a method for the positioning of operative cylinders on a grinding machine and a grinding machine which implements this method; it should be pointed out that the definition "operative cylinders" refers, for example, to cylinders of rolling mills for the rolling of metals, those used in paper-mills, those used in oil-pressure applications, shafts of marine motors and in general all cylinders made of metallic and non-metallic materials which are of industrial interest.

BACKGROUND OF THE INVENTION

[0002] The grinding of the cylinders described above, and in particular cylinders of rolling-mills or paper-mills, has various drawbacks, associated first of all with the encumbrance and weight of the same which are often considerable.

[0003] The latter, in fact, have dimensions varying from 40 mm to 2300 mm in diameter, 1,000 mm to 12,000 mm in length and weights ranging from a few tens of daN up to 230-250 t.

[0004] The function assigned to these cylinders requires that they be processed with a precision and accuracy in the order of a few thousandths of a millimeter.

[0005] The grinding machines which can be used for these cylinders therefore have specific characteristics and must not be confused with the smaller and traditional lathes or similar machines which, in this sense, are not capable of effecting these grinding processes.

[0006] The grinding of a cylinder must always be preceded by a preliminary positioning phase of the latter on the machine, which is effected by inserting the cylinder to be ground between a piece-holder head and a tailstock center and subsequently supporting it between centers of the machine and, if necessary, tightening it with one or more lunettes or contrast devices, or resting the cylinder itself directly on a pair of supporting lunettes; either of the two solutions is selected in relation to the type of cylinder to be ground and the processing to be effected.

[0007] In the case of the processing of so-called "thin" cylinders, for example, or cylinders in which the diameter/length ratio is particularly small (a typical example of these is represented by cylinders of "Sendzimir" rolling mills or, more generally, "cluster" rolling mills), the known art envisages that the cylinder to be ground is first loaded onto the grinding machine with a loading device (such as, for example, a gantry crane, a jib crane or an automatic loading device), it is then moved until one of its ends is supported by the center of the piece-holder head, the tailstock center is then moved until the contact with this supports the opposite end of the cylinder, and finally the lunettes or contrast devices are moved along the cylinder, so as to position them correctly with respect to the part of the cylinder to be ground.

[0008] The lunettes or contrast devices are normally produced as supports suitable for opposing the thrusts that the grinding wheel exerts on the piece being processed; they are normally positioned at regular distances along the cylinder, in order to uniformly oppose the forces during the grinding process.

[0009] As the piece-holder head is fixed, all the important distances are therefore measured from the piece-holder head and the tailstock center and lunettes or contrast devices are positioned in relation to this reference, moving them in an axial direction to move them towards or away from the reference, depending on the length of the cylinder.

[0010] The execution of such operations, typically defined by the term set-up can be manual or automatic. In the former case, the set-up time is extremely important as a series of various operations are required, which must be accurately effected in order to verify their correctness. In the latter case, a reduction in the set-up times jeopardizes the simplicity and reliability of the machine, as both the lunettes and the tailstock center must be equipped with suitable movement devices and relative control systems.

[0011] Another drawback linked to the known art relates to the fact that during the loading, the cylinder must be moved in three directions and in particular, among these, also along the longitudinal axis, in order to be correctly positioned on the grinding machine; these regulation movements require the use of a loading device. In manual plants, this device is typically a gantry crane or a jib crane and the precision with which the cylinder must be moved and positioned requires long positioning times, skilled operators and the risk that, with an erroneous maneuver, the cylinder, or machine, or both, can be damaged. In automatic plants, the movement of the cylinders is effected with **3**-axis loading systems and if, on the one hand, they reduce the maneuvering times and increase the safety of the same, on the other, they require machines which move the load along **3** axes and are consequently, by nature, complex, costly and require maintenance. The positioning of the lunettes and tailstock center is also quite lengthy with the traditional technology, in the sense that they must be moved along the cylinder to be correctly positioned, care being taken to measure the distances from the side of the cylinder associated with the piece-holder head. Also in this case, if, on the one hand, the manual solution is economical, on the other, it requires time and accuracy on the part of the operator, whereas although the automatic solution guarantees operational velocity and precision, it requires a movement and control mechanism for the tailstock center and for each of the lunettes.

[0012] In the case of manual machines, these problems are even more serious due to the fact that cylinders having different lengths must often be ground consecutively: these set-up operations must therefore be effected for each processing, with considerable time consumption.

[0013] In particular, not only must the tailstock center be moved each time, but also the lunettes, as the distances from the piece-holder head (which serves as a reference) must be measured each time and all the lunettes must therefore be moved along the cylinder.

SUMMARY OF THE INVENTION

[0014] The general objective of the present invention is consequently to overcome these and other drawbacks of the known art.

[0015] This objective is achieved by a grinding method and a grinding machine having the characteristics specified in the enclosed independent claims and in the dependent claims, which should be considered as being an integral part of the present description.

[0016] A positioning method has been conceived for these cylinders which envisages at least the following steps:

[0017] positioning the transversal, longitudinal center-line plane of the cylinder in correspondence with a reference point situated between a movable piece-holder head and tailstock center of the machine;

[0018] moving both the piece-holder head and the tailstock center until they are coupled with the cylinder.

[0019] The movement of the piece-holder head and tailstock center is preferably of the same entity, in the same direction and opposite senses.

[0020] In this way, the reference system is identified specifically by the transversal, longitudinal center-line plane of the cylinder, and not already by one of its ends, as in the known art.

[0021] For this purpose, the piece-holder head and tailstock center are integral in their translation movement with respect to the frame of the machine, for example by coupling them both with the same screw, so that a rotation of the latter causes the same movement of both, in the same direction but in opposite senses.

[0022] In this way, the advantages obtained are evident: firstly, it is not necessary to axially move the cylinder on the machine to position it on the piece-holder head and it is therefore sufficient to use a loading device with only two movement axes, simpler and less costly, whether it be manual or automatic.

[0023] Furthermore, the central reference system, coinciding with the longitudinal center-line plane of the cylinder, offers other advantages: if, for example, an odd number of lunettes (one, three, etc.) is used, it is not necessary to reposition the lunette or central contrast device each time, which is preferably fixed on the machine in the position in which the center-line of the cylinder is assembled.

[0024] Similar advantages are also obtained even if the number of lunettes is equal (two, four, etc.) as, also in this case, the positioning of the lunettes must be symmetrical with respect to the center-line of the cylinder.

[0025] This advantage in terms of set-up time saving is verified in each processing and even more so when various consecutive processings of cylinders having different lengths must be effected on the same machine: in this latter case, in fact, it would be necessary in the known art to also reposition the possible central lunette each time, whereas with the present invention, it always remains in the same position.

[0026] By using the reference system situated in the center-line of the cylinder, moreover, an additional advantage is obtained: experience has shown that it is not in fact necessary to move the lunettes when the dimension of the cylinders that must be consecutively processed on the same machine varies within a range of about 0.5 meters.

[0027] It has been noted, in fact, that if the variation in the longitudinal dimensions of the cylinders remains within this range, all the lunettes (both the central one, if envisaged, and the side ones) can be kept in the same positions, thus drastically reducing the set-up time.

[0028] Furthermore, the positioning of the side lunettes is simplified as the distances can be measured by the central reference system, i.e. the center-line of the cylinder simplifying the movement and avoiding possible errors.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] The structural and functional characteristics of the invention, as also its advantages with respect to the known art, will appear more evident form the following description, referring to the enclosed drawings which show a possible practical embodiment of the same invention.

[0030] In the drawings:

[0031] FIG. **1** illustrates a machine according to the present invention;

[0032] FIG. **2** illustrates a detail of the machine of FIG. **1**;

[0033] FIGS. **3** and **4** illustrate details of the machine of FIG. **1**.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0034] Describing first the positioning method, object of the present invention, it always comprises the following steps:

[0035] A—positioning the transversal, longitudinal center-line plane of the cylinder in correspondence with a reference point situated between a movable piece-holder head and tailstock center of said machine;

[0036] B—moving both the piece-holder head and the tailstock center until they are coupled with the cylinder and supporting it.

[0037] An overall version of the positioning method also envisages the following steps:

[0038] A1—preparing a rolling cylinder to be ground;

[0039] A—positioning the transversal, longitudinal center-line plane of the cylinder in correspondence with a reference point situated between a moveable piece-holder head and a tailstock center of the machine,

[0040] B—moving both the piece-holder head and the tailstock center until they are coupled with said cylinder and supporting it;

[0041] C—positioning at least two supporting side lunettes or contrast devices of said cylinder at the same distance from said central contrast lunette.

[0042] The reference point mentioned in step A above can possibly coincide with the positioning of the transversal, longitudinal center-line plane of said cylinder in correspondence with a fixed lunette with respect to the frame of the machine and/or with respect to the side lunettes.

[0043] Numerous variants can obviously be applied to the method described, all object of the present invention; in this sense, some of the steps of the method can be inverted (for example steps B. and C. can be exchanged) or other steps of the method, relating to secondary regulations of the machine can be added; or it is also possible that the central lunette, due to a particular form and geometry of the cylinder, may not be used.

[0044] With reference to step A, the reference point, this is preferably fixed onto the machine and coincides with a lunette or contrast device, in particular with the central lunette, as will appear more evident below, in the description of the machine. This lunette can obviously be removed to allow the grinding of cylinders having a particular form and geometry.

[0045] Both the piece-holder head and tailstock center can preferably be moved so as to be always equidistant from the reference point: their movement, in other words, is of the same entity and is always effected in the same direction but in opposite senses.

[0046] Also with respect to the side lunettes, or those situated at the sides of the central lunette which coincides with the reference point, these can be advantageously moved to the same degree and in the same direction, but in opposite senses.

There can be one or more of these side lunettes but always in the same quantity on both sides with respect to the central lunette.

[0047] In this way, the advantages discussed above are obtained, as the reference point for the whole positioning phase is no longer an end of the cylinder but its center-line, thus allowing the above advantages to be obtained.

[0048] As far as the machine is concerned, reference should be made to FIGS. **1** and **2**.

[0049] The grinding machine **10** comprises a base **11** on which a piece-holder head **13** and tailstock center **12** are movably assembled, which serve to move and possibly support a cylinder **14** which is positioned between them during the grinding operation.

[0050] More specifically, the machine **10** is of the type in which the processing cylinder is supported by two rotating centers **81** and **83** positioned in the piece-holder head **13** and tailstock center **12**.

[0051] The lunettes **20**, **21**, **22** are positioned in contact with the cylinder and have the function of providing a contrast to the possible bending of the cylinder due to the same processing.

[0052] It should be pointed out that the machine **10** can equivalently be of a different type, in which the lunettes, in addition to having the function described above, also have the function of supporting the whole weight of the cylinder being processed, whereas the piece-holder head and tailstock center only have the function of bringing it into rotation, to allow its grinding.

[0053] The piece-holder head **13** comprises a single body which is capable of translating thanks to the presence, in the lower part, of two linear guides **80** with which it is coupled by means of suitable sliding blocks.

[0054] The rotating center **81** can be housed inside the body of the piece-holder head **13**, which, in some applications, forms a rest for the cylinder. In the rear part, on the other hand, a motor **71** can be positioned, with the relative transmission, for rotating the cylinder.

[0055] The tailstock center **12** also comprises a body which is capable of translating thanks to the presence of two linear guides **80** situated in the lower part of the structure with which it is coupled by means of suitable sliding blocks.

[0056] The movable center **83** can be housed inside the tailstock center **12**, which, in some applications, forms a second rest for the cylinder.

[0057] Furthermore, if required by the particular application under examination, the tailstock center **12** can house a device in its lower part, which generates a preloading through a spring device.

[0058] This preloading acts in an axial direction and guarantees the continuous contact between the cylinder and two movable centers **81** and **83** and, at the same time, the desired axial preloading, if this is required by the processing, as is the case, for example, in the grinding of so-called "thin" cylinders.

[0059] The machine **10** also comprises a grinding wheel which can be moved parallel to the axis of the cylinder, not shown for the sake of conciseness, and in any case known in itself in this type of grinding machine.

[0060] Both the piece-holder head **13** and tailstock center **12** can be moved linearly along the base **11** so that they can move towards or away from each other, to house cylinders having different lengths.

[0061] The piece-holder head **13** and tailstock center **12** are coupled to movement means which allow their linear approach or withdrawal movement to the same extent, in the same direction and in opposite senses.

[0062] The movement means of this example comprise a worm screw **16** engaged with both the piece-holder head **13** and tailstock center **12**, so that, when brought into rotation, the screw **16** actuates both the approach or withdrawal in the same direction along which the screw **16** extends; these movement means are illustrated in more detail in FIG. **2**.

[0063] For this purpose, the screw **16**, produced in a single piece, has two threaded parts **160** and **161** with which a corresponding female screw of the piece-holder head **13** and tailstock center **12** is engaged.

[0064] In order to allow a movement in the same direction and of the same entity, but in opposite senses, the two threaded parts **160**, **161** of the screw **16** have contrasting helicoidal threadings, for example an anticlockwise threading and a clockwise threading, preferably having the same pitch.

[0065] It should be pointed out that two separate helicoidal screws with a contrasting threading can be equivalently envisaged, instead of a single screw **16**, or the latter may not be in a single piece but separable into two different sections connected with appropriate joints.

[0066] The screw **16** is actuated in rotation by a motor **17**, for example an electric brushless motor or the like.

[0067] In this way, by correctly positioning the cylinder so that its transversal longitudinal center-line plane is in correspondence with the reference point of the machine **10** and actuating the screw **16**, the piece-holder head **13** and tailstock center **12** move towards the ends of the cylinder, subsequently being coupled with it and possibly supporting it.

[0068] It should be noted that this solution also effects a kind of self-centering of the cylinder between the head **13** and tailstock center **12**, if in fact the cylinder were not correctly positioned along its axial direction, as both the head **13** and tailstock center **12** move with respect to a common central reference to the same degree, in the same direction and in opposite senses, their approach movement would allow a centering of the cylinder.

[0069] This particular feature, on the one hand makes manual loading of the cylinder simpler, safer and more rapid, whereas on the other, it significantly facilitates the projecting of mechanisms of a possible automatic loading system.

[0070] The machine **10** also comprises contrast or supporting lunettes **20**, **21**, **22**.

[0071] These, in the particular case of the grinding of so-called "thin" cylinders, must at least be present in one unit **20**, but generally in at least three units **20**, **21** and **22** and normally in an odd number. The use of lunettes in an even number, i.e. without the central lunette, is only envisaged in particular cases, when the geometry of the cylinder requires this. Consequently, except for this particular case, the set of lunettes always comprises a central lunette **20** or, more generally, the central lunette **20** and two side lunettes **21** and **22**, or four side lunettes etc.

[0072] The cylinder is assembled with its transversal, longitudinal center-line plane (which, as in the case of so-called "thin" or Sendzimir cylinders, often coincides with the symmetry plane passing through the center of gravity and perpendicular to the generatrices of the cylinder) in a position corresponding to the central lunette **20**.

[0073] The latter, at least in the case mentioned above, is consequently generally fixed in position with respect to the machine **10** or at its base destined for resting on the ground, and does not have to be moved when cylinders having different lengths are being processed, as, in any case, the longitudinal center-line point of the cylinder is always assembled in correspondence with said central lunette **20**.

[0074] In this sense, it is also possible to mechanically fix the central lunette **20** to the machine **10**, for example by means of screws or bolts, or make it integral with at least part of the base **12**, so that it represents a central and privileged reference point for the measurement and calculation of other dimensions.

[0075] Considering the case, for example, of three lunettes, as far as the side lunettes are concerned, **21** and **22**, their position can be manually regulated or, in more evolved variants of the machine **10**, they can be connected to a specific worm screw or to the same screw **16** which activates the piece-holder head **13** and tailstock center **12**, so that they are moved in the same direction and to the same degree, but in opposite senses, by means of a single and simple actuation of the screw with which they are coupled, consequently reducing or eliminating the risks of an incorrect positioning of both: in this way, in fact, they cannot be positioned at different distances from the central lunette **20**, but are always advantageously equidistant with respect to the same.

[0076] In this sense, a variant envisages controlling the position of both the lunettes **20**, **21**, **22** and the piece-holder head **13** and tailstock center **12** by means of a single screw command and a series of threaded sleeves **90** (one for each device to be moved) shown in FIGS. **3** and **4** enclosed.

[0077] Each sleeve **90** comprises a cylindrical mantle and is engaged with the worm screw **16** by means of a threading inside the same mantle.

[0078] Each sleeve **90** can also be connected to the unit to be moved by means of a suitable mechanism. In principle, it should be noted that, as an alternative to the brake blocks described hereunder, in the light of the disclosures provided herein, an expert in the field can also envisage other different solutions; for example, instead of a brake block, the blocking means of the unit to be moved can comprise electromagnets, mechanical coupling means such as fixing pegs, wedges, removable interference profiles or other similar items.

[0079] For illustrative and non-limiting purposes, one of these coupling/decoupling means is described hereunder.

[0080] The coupling/decoupling means of the sleeve to the part to be positioned comprise two arms **91**, **92** pivoted to the structure of the part to be moved (piece-holder head, tailstock center and lunette) and each provided with an engagement end **93**, **94** with said sleeve **90** and an opposite free end **95**, **96** coupled with an actuator **97**.

[0081] The actuator **97** is preferably a linear actuator, for example a gas, pneumatic, hydraulic, electric actuator or similar: in the non-limited embodiment illustrated, it is a hydraulic actuator equipped with a cylinder and piston which protrudes variably from the cylinder.

[0082] The actuator **97** is coupled, preferably hinged, to the free ends **95**, **96** of the arms **91**, **92**; each engagement end **93**, **94** of each arm **91**, **92** is equipped with a clamp with linings for coupling with the outer cylindrical surface of the sleeve **90**.

[0083] The two arms **91**, **92** have their fulcrum along their body in the points O**1** and O**1** **1** so as to oscillate, so that as the two free ends **95**, **96** approach, the opposite ends **93**, **94** move away and vice versa.

[0084] The machine **10** preferably comprises a single screw **16** and both the head **13** and the tailstock center **12** and lunettes **20**, **21**, **22** are equipped with these coupling/decoupling means, each having a specific corresponding sleeve.

[0085] In this way, there is a plurality of sleeves along the body of the screw, one for each coupling/decoupling means.

[0086] The functioning can be deduced from what has been described so far: when the actuator of one of the coupling/decoupling means is activated to close the linings over the corresponding sleeve, the same part of the machine (head, tailstock center or lunette) can be controlled in translation as a result of the rotation of the screw **16**, by activating the latter, in fact, the sleeve, which is prevented from rotating, moves along the screw **16**, entraining in translation the element to which the arms are pivoted.

[0087] It is therefore possible, with a simple and accurate system, to move head, tailstock center and lunette to position them correctly on the base **11**, drastically reducing the set-up times of the machine **10**.

[0088] Furthermore, in this way, both the lunette and the head and tailstock center can be activated contemporaneously or separately with a single command, obtaining an extremely high versatility of the machine.

[0089] In short, the connection between each female screw and the part to be moved associated with it, is obtained by means of a system which operates in the following way: if a certain part is to be moved, for example the tailstock center, said blocking system constrains the threaded sleeve **90** (or female screw) to the body of the tailstock center itself and, at the same time, prevents its rotation, so that, once actuated, the screw rotates and the female screw, constrained to the tailstock center, cannot rotate integrally with the screw and consequently causes the tailstock center to translate.

[0090] If, on the contrary, the piece-holder head is to be moved and the tailstock center kept immobile, it is sufficient to disengage the specific sleeve from the body of the tailstock center and contemporaneously constrain that of the piece-holder head; in this way, once the screw begins to rotate (in this case to move the piece-holder head) the sleeve of the tailstock center will rotate integrally with itself, maintaining the sleeve itself in the same axial position and consequently not causing any movement of the tailstock center.

[0091] In this way, either the lunettes or the head or the tailstock center can be simply and rapidly activated contemporaneously or separately, to allow the cylinder to be suitably positioned and supported.

[0092] There can therefore be various movement conditions of the parts, which should be considered as being an integral part of the method described above, for example:

[0093] 1) Symmetrical positioning of the lunettes, piece-holder head and tailstock center with respect to the central reference of the machine: if only the female screw of both lunettes is integral with the screw, they will move for the same distance but in opposite senses, due to the constructive form of the worm screw. Contemporaneously the female screws of the piece-holder head and tailstock center are disengaged from the screw and these two groups consequently remain motionless. After positioning the lunettes, the piece-holder head and tailstock center are positioned by making the female screws of these integral and disengaging those of the lunettes.

This positioning procedure can be useful, for example, in the case of the grinding of symmetrical cylinders (for example Sendzimir).

[0094] 2) Asymmetrical positioning of the piece-holder head and tailstock center-symmetrical positioning of the lunettes: in this case, the lunettes are synchronously positioned, making both of the female screws of the latter integral with the screw. In this way, by actuating the screw, they will move for the same distance but in opposite senses. After positioning these two groups, their female screws are disengaged from the screw. At this point, the female screw of the piece-holder head and tailstock center are alternatingly made integral with the screw, moving first one group and then the other.

[0095] 3) Asymmetrical positioning of the lunettes, piece-holder head and tailstock center with respect to the center-line of the cylinder: in this case, the groups are positioned, each time making the female screw of one group integral with the screw, whereas the female screws of the other groups not involved in the movement, are disengaged. This procedure can be very useful for moving the above parts in the case of the grinding of asymmetrical cylinders (such as typically hot and cold rolling cylinders), or in applications where the piece-holder head remains fixed such as, in general, all applications except for the grinding of Sendzimir cylinders.

[0096] Numerous alternatives to the machine **10** described so far are possible, all considered as being an integral part of the present invention.

[0097] The movement means for the head **13** and for the tailstock center **12** and/or for the side lunettes **21** and **22**, for example, can be produced differently, for example by means of a transmission belt coupled with trolleys, so as to enable the movement of the head **13** and tailstock center **12** and/or lunettes, as envisaged above.

[0098] The movement means can equivalently comprise two separate screws and two motors, even if, in this case, the cost of the machine is higher.

[0099] The center-line of the whole machine **10** can also advantageously coincide with the central lunette **20**, making the positioning of the cylinder even more simple and intuitive.

[0100] The objectives mentioned in the preamble of the description have therefore been achieved.

[0101] The scope of the invention is defined by the following claims.

The invention claimed is:

1. A positioning method for operative cylinders, for example of rolling-mills or paper-mills, on a grinding machine the method comprising the following steps:

a. positioning a transversal, longitudinal center-line plane of a cylinder in correspondence with a reference point situated between a movable piece-holder head and tailstock center of a grinding machine; and

b. moving said piece-holder head and said tailstock center towards a direction of said cylinder until there is a reciprocal coupling, for entraining and/or supporting the cylinder.

2. The method according to claim **1**, wherein said reference point is positioned equidistant from said piece-holder head and said tailstock centercentre.

3. The method according to claim **1**, wherein said moving in step b comprises moving said piece-holder head and said tailstock center of same entity, in a same direction and in opposite senses.

4. The method according to claim **1**, further comprising the following steps:

preparing the cylinder to be ground;

positioning the transversal, longitudinal center-line plane of the cylinder in correspondence with the reference point situated between the moveable piece-holder head and the tailstock centre of the machine;

moving said piece-holder head and said tailstock center until coupled with said cylinder; and

positioning at least two supporting side lunettes (**21**, **22**) of said cylinder at a same distance from said reference point.

5. A grinding machine for operative cylinders, for example of rolling-mills or paper-mills, comprising:

a base;

a piece-holder head; and

a tailstock center suitable for being coupled at opposite ends of a cylinder to be ground, in order to rotate said cylinder,

wherein said piece-holder head and said tailstock center are designed to be translated with respect to said base.

6. The grinding machine according to claim **5**, wherein said piece-holder head and said tailstock center are coupled with a moving system configured to allow their linear translation for their reciprocal approach or withdrawal.

7. The grinding machine according to claim **6**, wherein said moving system is configured to allow a movement of said piece-holder head and said tailstock center in a same direction, of a same entity and in opposite senses.

8. The grinding machine according to claim **6**, wherein said moving system comprises an endless screw coupled with the piece-holder head and tailstock center.

9. The grinding machine according to claim **6**, further comprising a central lunette for central contrast and at least two side lunettes for one or both of contrast or support of said cylinder, said central lunette being positioned in an equidistant position from said piece-holder head and said tailstock center.

10. The grinding machine according to claim **9**, wherein said moving system for the piece-holder head and the tailstock center is coupled with said side lunettes, for determining a reciprocal movement in a same direction, of a same entity and in opposite senses.

11. The method according to claim **4**, wherein said reference point coincides with a supporting lunette of said cylinder.

12. The grinding machine according to claim **8**, wherein said screw preferably is composed of a single piece and comprises two threaded parts having a discordant, helicoidal threading.

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